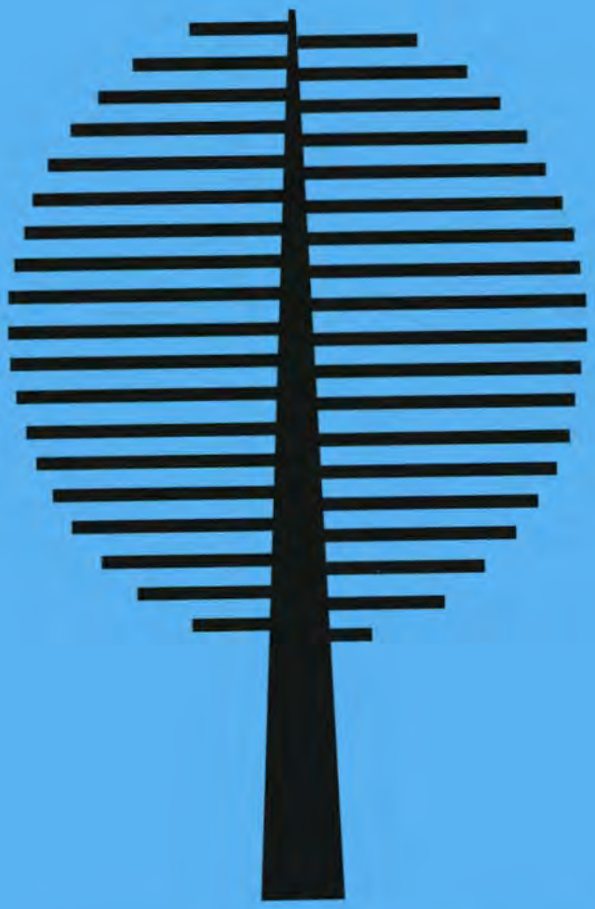
AN APPROACH TO ASSESSING PROGRESS TOWARD SUSTAINABILITY

Tools and Training Series

Participatory and Reflective Analytical Mapping for Sustainability (PRAM)



Alejandro Imbach, Eric Dudley, Natalia Ortiz and Hernando Sanchez

1997

IUCN
The World Conservation Union

Participatory and Reflective Analytical Mapping for Sustainability (PRAM)

(This is an edited English translation
of the Spanish PRAM)

Alejandro Imbach, Eric Dudley, Natalia Ortiz and
Hernando Sanchez

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This booklet was written by Alejandro Imbach and Eric Dudley, members of the International Assessment Team, and Natalia Ortiz and Hernando Sanchez members of the Country Pilot Team for Colombia. Additional members of the IUCN International Assessment Team who reviewed PRAM are: Robert Prescott-Allen, Diana Lee-Smith, Ashoke Chatterjee, Tony Hodge and Adil Najam. The group is coordinated by Nancy MacPherson.

This work was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada. These publications are one outcome of the project on assessing progress towards sustainability of IUCN (World Conservation Union) supported by IDRC. The project started by bringing together an international working group to discuss the problems of monitoring and evaluating sustainable development. The group soon realised that there was little point in monitoring and evaluating unless one had an idea of where one wanted to go, and that this understanding could best be developed through a questioning approach. A set of methods and tools, including the early drafts of this booklet, were developed and tested in pilot field trials in Colombia, India and Zimbabwe.

Print production of this booklet has been assisted by grants from the International Development Research Centre (IDRC, Canada) and the Swiss Agency for Development Cooperation (SDC).

About the Series

This series of eight volumes has been developed by a cross-disciplinary team for people interested in assessing progress toward sustainability. Despite differences in emphasis, the materials share a common framework and key principles. We suggest that there are four basic linked steps to understanding sustainable and equitable development:

1. Wholeness. People are an inextricable part of the ecosystem: people and the environment need to be treated together as equally important. Interactions among people and between people and the environment are complex and poorly understood. Thus we need to start by...

2. Asking questions. We must recognize our ignorance, and ask questions. We cannot assess anything unless we know which questions to ask. To be useful — to help make progress — questions need a context. Thus we need...

3. Reflective institutions. The context for the questioning approach is institutional: groups of people coming together to question and to learn collectively. The process of reflection will, we suggest, lead inevitably to an approach that is...

4. People-focused. People are both the problem and the solution. Our principal arena for action lies in influencing the motivation for human behaviour.

The series starts with the summary document, *Overview of Methods, Tools and Field Experiences: Assessing Progress Toward Sustainability.* The other seven volumes fall into three sets:

Methods of system assessment (people and the ecosystem)

- Participatory and Reflective Analytical Mapping (PRAM)
- Assessing Rural Sustainability
- Planning Action for Rural Sustainability

Methods of self assessment (for organisations and communities to examine their own attitudes, capacities and experiences)

- Reflective Institutions

Tools (for use in conjunction with any of the methods or with other methods)

- Barometer of Sustainability
- Community-based Indicators
- Questions of Survival

Assessing Rural Sustainability and *Planning Action for Rural Sustainability* are designed to be used together. They can also be used with *Participatory and Reflective Analytical Mapping (PRAM)*, although this is conceived as a separate method. *Barometer of Sustainability* and *Community-based Indicators* may be used with any method of system assessment. *Questions of Survival* may be used with any method of system assessment or self assessment.

Methods and tools may well have to be adapted to local circumstances, and some may not be relevant. Solutions must be people-focused to be sustained. We urge the user, when using these documents, to keep in mind the underlying approach:

- recognize the wholeness of people and the ecosystem together;
- decide which questions to ask before searching for indicators; and
- create opportunities for groups to reflect and learn as institutions.

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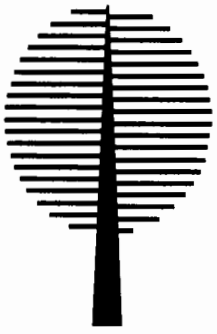


Introduction

Progress towards sustainability is the key issue of our time. In this endeavour not only is our own wellbeing at stake, but also the future of our children and grandchildren, threatened by the unsustainable use of natural resources in our societies.

Because many efforts are being made throughout the world to confront this problem, there is a growing need to measure, or at least to estimate, whether we are advancing in the right direction. We need to be able to strengthen appropriate decisions by receiving feedback from the decision-making system itself.

This is not an easy task. There will never be a permanent state of sustainability, only an ongoing process of searching for it. Sustainability is a moving target because of the changing ways in which humans fulfil their needs. If we conceive of sustainability as a balance between meeting human needs and the capacity of natural systems to provide products without degradation, then we must recognize that there will always be the potential for tension and conflict between the people and the ecosystems within which they live. Therefore, to progress towards sustainability is to find ways to ease those tensions and conflicts given human capacity to reduce or change the pressures on the environment.

The fact that there is no final state of sustainability, and lack of understanding of this fact, has several implications. The evaluation or assessment task cannot be conceived in terms of measuring how far we have to go to a final point, but rather in terms of how far we have advanced in human and ecosystem wellbeing. The second implication is that there is no blueprint for evaluating sustainability. The evaluation or assessment must strengthen an attitude of questioning the process, relevance and results of the activities in question.

Introduction

It is necessary to differentiate between the assessment of projects and programmes that go through a formal planning procedure and assessments of individual or collective processes that are not formally planned. This is a key distinction, because the evaluation approach and tools required in each situation are different.

Participatory and Reflective Analytical Mapping (PRAM) is a method devised for the assessment of unplanned processes. PRAM can be used by projects and programmes to assess the context in which they are operating in order to improve their understanding of progress towards sustainability.

Like any evaluation method, PRAM has been devised from an explicit conceptual framework. Understanding the conceptual base of PRAM is of fundamental importance in its application.

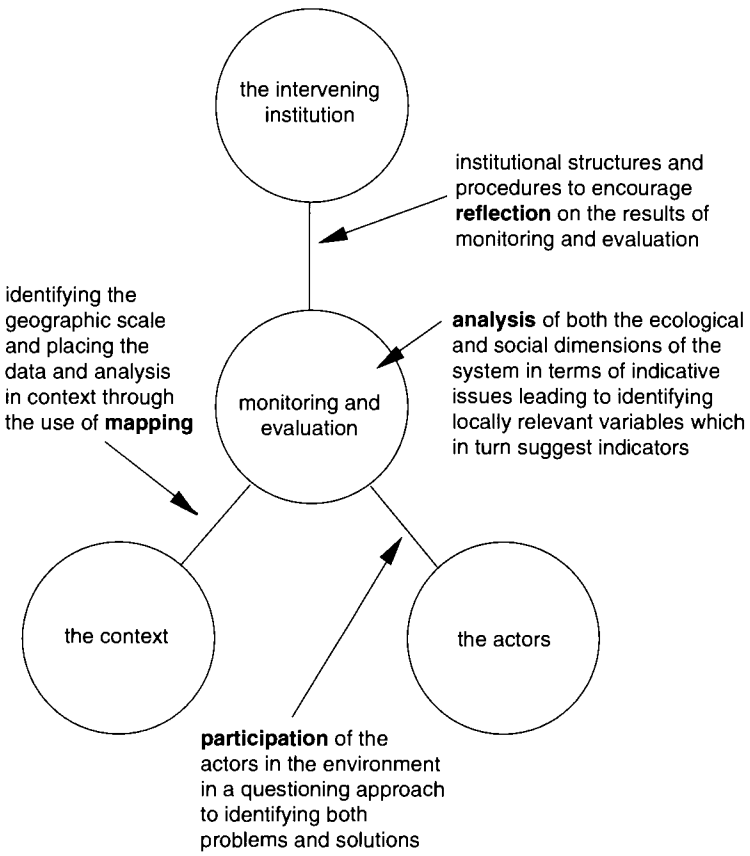
Why a new method for monitoring and evaluation?

In the last few years various methods have been proposed to address monitoring and evaluation of sustainable development activities: the Logical Framework Analysis, the Pressure-State-Response model, and many methods from the fields of health and education.

PRAM looks at the whole system and not just one part of it. This forces evaluators to look at the general situation first and then its components. The diagram below shows the method of evaluation as conceived in PRAM. The four main components of PRAM are: the institution and its decision makers (the Intervenor): the context in which the institution operates (the System): the social actors who interact among themselves and with the institution; and the monitoring and evaluation process.

The PRAM diagram highlights the relationship of the elements of PRAM (participation, reflection, analysis and mapping) to these four components.

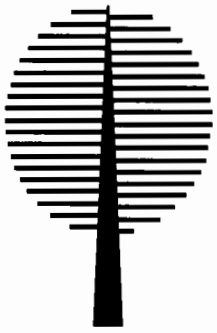
Figure 1. The PRAM diagram



Introduction

This document outlines the conceptual base of PRAM, followed by the operative process of the methodology. Several boxes have been inserted along with the text to present in greater detail relevant ideas and concepts that relate to the process.

Examples of applications of PRAM at the regional and farm level are presented in the last sections of this booklet.



Conceptual Framework

Human and ecosystem wellbeing

The phrase "to evaluate" means "to give value" or "to judge" (The Webster dictionary).

From this definition, evaluation may be defined as the act of judging or determining the value, merit or quality of something, whether finished, ongoing, or simply proposed. The "something" we are considering in PRAM is progress toward sustainability.

The act of judging implies a definition of what is good or desirable and what is bad or undesirable. There is no universally shared definition of good or bad; on the contrary, there are many different definitions. The conceptual framework of PRAM enables users to define good and bad. What is referred to in this document as the conceptual framework is a process of defining values and concepts that make explicit definitions of good and bad from a particular perspective.

It is imperative that we make our conceptual framework explicit in order to define what is considered good or bad, or improving or worsening. It is meaningless to use an evaluation methodology without clearly defining its conceptual framework and the philosophical or ideological basis upon which it is designed.

The basic issue to keep in mind is that there is not and there never will be a final state of sustainability. There will always be tension and conflict between the changing ways in which humans satisfy their needs and the environment's capacity to provide products without degradation.

The recognition of this tension and subsequent efforts to resolve or ease the conflict, along with the understanding that assessment is a process (not a judgement on how close we are to a final state), is basic to the overall PRAM conceptual framework. Sustainability is a balance between human wellbeing and ecosystem wellbeing. They are inseparable.

Conceptual Framework

There is a clear cause and effect relationship between human and environmental problems. It is the actions of humans that determine progress toward sustainability. The PRAM conceptual framework visualises progress toward sustainability as a social process with environmental effects.

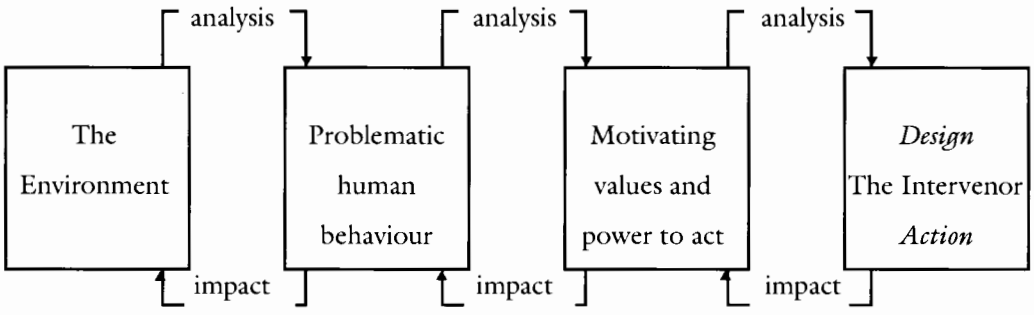
Decisions have their roots in ethics, values and principles that each person uses to discriminate between good or bad, desirable or undesirable. Ethics are closely related to culture; culture is a set of spiritual and material characteristics that identify a certain human group. Ethics grow from a group's history, its relations with other cultures, and its interaction with the environment. All perceptions are related to culture. Even health, housing and quality-of-life issues, that are considered as "objective basic measurable needs" depend on cultural perspectives.

There are many different cultures around the world. PRAM's conceptual framework considers that all cultures are equally valuable and that it is possible to identify cultural values that lead to better or worse environmental decisions. Even when differing cultures are equally valued, their effects on the environment can be different. Consequently, considerable effort must be made to avoid cultural bias during the evaluation process.

People: The problem and the solution

It is necessary to recognise that, generally, environmentally active institutions can do very little directly to change natural processes that affect the environment. The best they can do is to influence collective social processes that affect the environment.

Figure 2. The chain of influence



In order to understand environmental problem, we must understand human behavior and its relationship to the environment. We need to understand why people behave like they do and why they are not behaving in another way. We need to understand what values lie behind their behavior as well as what power (or the lack of it) determines their capacity to practice their values. We need to understand the chain of influence between environment and people, and to realize that the arena for our actions should be focused on influencing human values and power.

Both cultures and values change over time as a result of factors such as the influence of other cultures, the development of new technologies and environmental changes. Cultural values also change as a result of social influences such as education, fashion, persuasion, and natural influences such as catastrophes. It is important to recognise that values change as cultures evolve.

Values are one part of the equation, the other is the distribution of power. The power of a group to make choices based on its value system can be limited by the greater power of other groups. Powerful groups have the

capacity to impose their decisions, and consequently their values, on other groups. These impositions may seriously limit progress toward sustainability.

When power is concentrated there is often little accommodation of other views. The weakest groups are often forced to make environmentally damaging decisions out of desperation, while the most powerful groups do the same out of greed or laziness.

The PRAM conceptual framework assumes that an analysis of power (i.e. who owns, uses, manages resources) focuses the evaluators to understand the role of power relationships in natural resource management, often drawing out the significant imbalances of power between women and men, different ethnic groups and/or other groups.

Tensions and conflicts, whether produced by changes in values, culture or a shift in power, must be addressed through a series of negotiations and conflict management processes. It should be noted, however, that negotiation does not always mean the end of conflict. The resolution of one conflict can and often does lead to another conflict. These must be dealt with in an ongoing process.

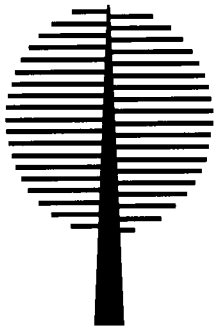
A society that progresses toward sustainability is characterised by a long term trend towards improved environmental conditions by ensuring that the demand for goods and natural resources:

- is placed within environmental limits to preclude irreversible environmental degradation;
- is actively negotiated among different groups in such a way that their different material and spiritual needs are satisfied.

In many situations social and environmental pressures arising from this process will require changes in the way needs are satisfied. This in turn will

demand changes in underlying values. PRAM considers the following as critical social aspects in the evaluation of progress toward sustainability:

- full consideration of ethics and values;
- organisation and representation of less powerful groups in the assessment process; and
- mechanisms of negotiation to identify, reduce and/or resolve conflict.



The Framework of Evaluation

The issues vital to evaluation can be identified in a relatively simple way through answering the following questions:

- What is going to be assessed?
- Why? What is the evaluation trying to achieve?
- For whom? Who is going to use the assessment?
- Who is going to make the evaluation?
- How is the evaluation going to be made?

The answer to these questions depends on the situation, and will result in adapting the evaluation to suit the circumstances.

A short analysis of the questions will show how the conceptual basis of PRAM works.

What is going to be assessed?

Progress of a 'unit' such as a nation, region or community toward sustainability is the focus of the PRAM approach.

Why assess?

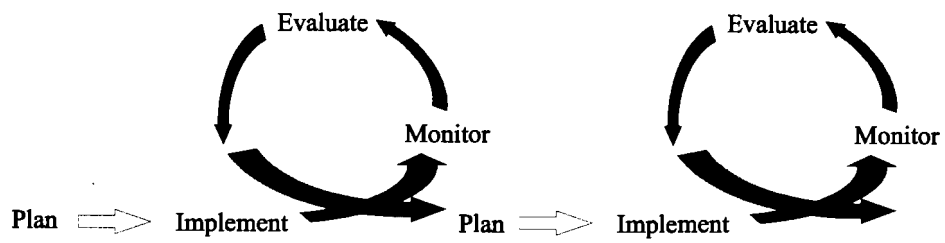
We evaluate to judge or determine the value, merit or quality of an activity or process that is finished, ongoing, or simply proposed - in this case, the progress of a nation, region or community toward sustainability. In addition, PRAM is a tool that develops and strengthens the reflective capacity of its users (individuals, groups, institutions) and improves their decision making processes.

The PRAM conceptual framework emphasises that there is not a single sustainable state, that the progress toward sustainability pursues a moving target. If this is correct, conventional planning methodologies are inadequate

since they seek to determine the initial state, the desired final state and the means of progressing from one to the other. From a sustainability point of view, knowledge of the present situation is often incomplete and the final state is unknown, and we can only make a best guess of what actions are the best way to move forward.

PRAM proposes that the best way to move toward sustainability is through an active cycle of reflection and action: Initial reflection leads to questions about reality: identification of the problem, decisions on actions to be taken, and the development of a hypotheses about this action. Reflection is followed by an action phase. Planned actions are carried out and then, immediately after this, a reflection phase takes place to review the knowledge that has been gained through the action, to analyse the actions that were carried out, and in light of this experience, to redefine the hypotheses if necessary. A new action phase begins, followed by another reflection phase, and so on.

Figure 3. The Action-Reflection Cycle



Actions are planned and constantly evaluated. What is working? What is not? Which actions have promoted desired results? Which have not? What desirable or unforeseen results have occurred? The only way to keep track of all of this is to shift continually between thinking and doing.

Learning by doing

The learning by doing, action research, or participatory action research idea is not new. But, while it has been used to rally advocates for many years, its deepest implications have still to really take hold. Nowhere is it more necessary than in the sustainable development field. On global sustainability issues we all are ignorant. Many people have ideas and opinions about the characteristics of sustainability. But how, in a real world of power, money and politics, do we satisfy the strong - and often legitimate - conflicting demands for limited natural resources, while also extending development benefits to people who are in real need?

The best we can do is to design activities based on our limited knowledge of reality (the only knowledge we have) and conceive of those activities as trials to be validated in practice (hypotheses to be verified), subject to rejection by practice. In this way we progress and learn at the same time, and learning is constantly being applied to the process.

It is possible to address our ignorance from:

- **Hypothesis-led planning.** This means designing each project and activity explicitly to examine and try out ideas about how the world works (how a people act and interact with environment and with others) and how to promote changes to improve those interactions.
- **Reflective Institutions.** Developing institutions that promote learning by doing: institutions that are not simple performing machines but that continually encourage their members and partners to question process, results and underlying hypotheses.

PRAM can be considered a tool of action research in that it focuses participation and reflection on an integrated analysis of activities essential to promote sustainability. The underlying hypothesis of PRAM is that better reflection will

help to make better decisions that will result in more effective and efficient, relevant actions with greater impact.

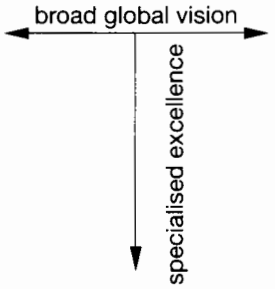
Who is going to use the assessment?

This is an important question and not always clearly answered. Evaluation is never performed in a vacuum. It is used to strengthen the reflective phase of the reflection/action. The methodology must adapt to produce results that are significant for the user (the person, group, institution, NGO, etc.).

Global vision and specialized actions

There is a great need in development for holistic thinking. Environmental issues are integrally linked to human development, and both are interwoven with their cultural, political and economic contexts.

However, if we have to develop a model of the whole world before making decisions we will become permanently paralyzed. Our challenge is to acquire global vision without losing specialized excellence. A balance, similar to the situation shown in the adjoining diagram, must be attained: a global shared vision that allows us to understand the context of our actions while we pursue rigorously and in depth the specific work in our own field.



The "T" diagram

It is important to consider the potential user of an evaluation and the user's capacity for reflection. The characteristics of reflective institutions are described by Dudley and Imbach in Developing Reflective Institutions (1995), a publication that is a part of this series. Experience suggests that reflective institutions are basically characterised by:

- a horizontal working structure that encourages team work, group participation in decision making, and exchange of experience between groups from different institutions;
- structures and procedures that assure feedback from experience and allow the learning generated by institutional activities to be shared by everyone involved;
- an operation that ensures the creation and maintenance of opportunities for reflection and the development and strengthening of a serious institutional reflective capacity;
- a planning system guided by explicit hypotheses. Activities are not seen as leading to assured results but rather as opportunities for testing hypotheses. Tasks are constantly monitored and analysed to make sure that they are heading in the right direction;
- a shared explicit vision of the past, present and future, so that all the members of the institution are aware of the learning that has resulted from past experiences, know what is going on now and why, and share common intentions for the future;
- a holistic vision of the global context combined with concrete and achievable actions which can be taken within their own clearly defined area of operations;
- a mechanism to constructively identify errors. Failures are potentially among the richest sources of learning and institutions need mechanisms to take advantage of this resource. The pressure to be seen to be "successful" can inhibit learning and progress; and
- a trend to breed more reflective institutions so that the reflective capacity is not simply a feature of an isolated institution, but is disseminated and adopted by other groups with which it works.

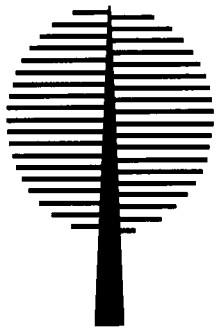
Institutions and groups that have a capacity for reflection will achieve greater benefits from PRAM than non-reflective institutions. Institutions and groups that lack a reflective capacity can use PRAM to start developing this capacity, however PRAM does not replace a reflective capacity, but rather enhances it. The successful development of reflective characteristics requires leadership and good organisation within the structure of an institution.

An experience in strengthening reflective capacity

An environmental NGO interested in improving its institutional functions, decided to include a monitoring and evaluation mechanism in its working processes. The reflection generated by this decision led, as a first step, to pointed questioning about the institution's purposes, its management, its own view of sustainability and the means by which they intended to achieve it. As a result, it became clear that there were no explicit or clear agreements either on the way to participate in decision making or on the decision making structure itself. The institution decided on an internal reconstruction process to address these concerns. This process was difficult to implement since it meant breaking traditional, comfortable working arrangements. However, as the process developed, results such as agreement on criteria for decision making and a greater understanding of the regional problems also developed. The decision making process and its consequent activities were refocused and supported by feedback from experience.

Who is going to make the assessment?

Evaluation activities should be carried out by the same institution or group that is going to use the evaluation. The help of experienced external support can be useful to facilitate the process but not to lead it. Within the PRAM conceptual framework it is not acceptable for external agents to make the evaluation and simply forward it to those who are going to use it.



The Operation of PRAM

PRAM is a methodology devised for implementation within an explicit conceptual framework. This requires a number of steps:

- An analysis of the context within which the institution, group or organisation that is going to do or use the evaluation. This can be done by a workshop with the institution members guided by a document such as Questions for Survival (Dudley and Imbach, 1996) that considers, in a methodological and integrated way, the critical aspects of the context.
- An institutional analysis of the institution/group/organisation, that will use the results of the evaluation. The institutional analysis includes an internal workshop to analyse the mission, vision, objectives, activities, capacity, and operation (organisation, decision making mechanisms, the priority issues in the institution, the reflective mechanism) of the institution.
- Consideration of the basic question(s) that the evaluation needs to address. What is going to be evaluated? Why? For whom? (For more details, see the section on Evaluation Framework in this document). This task must involve all those concerned.

Identify Complexity Levels

One of the first steps in using PRAM is to define the complexity levels so that they can be used in a consistent way through the whole exercise. Complexity levels may be based on ecological, social, political or administrative criteria. They may be used singly (only ecological criteria, or only social criteria) or combined. There are many different ways to order the same reality at different complexity levels, in each set of circumstances the most suitable one must be found. There are no specific recommendations about which criteria should be applied to any level. Choice of complexity levels depends on the objectives of those performing the assessment. However, whatever complexity levels are chosen, evaluation of sustainability requires both ecological and social analysis.

An example of a set of complexity levels is as follows: A basic unit of agricultural production is the farm. At this level different activities are carried

out and many environmentally important decisions are made - such as which crops to grow, which areas to use, which fertilisers, pesticides, and herbicides to use, how to handle waste, what to do about erosion, what to do with forests, etc.

A more complex level of the local community (village, town, etc.) includes a number of farms. At this complexity level processes important for sustainability take place in grassroots organisations concerned with such things as marketing produce, communal management of natural resources, constructing and maintaining roads, and so on. In turn, the complexity level of a village is a part of more complex levels such as district, landscape or watershed, country, region and continent.

When defining complexity levels it is important to remember the following points:

- Each complexity level is connected to the level above and below, and the links and interaction among different complexity levels should be identified.
- Each complexity level has its own actors, decision makers and processes, that need to be identified.

Select the resolution level

Having identified the set of complexity levels relevant to the evaluation, the next step is to identify the complexity level that the institution wishes to make its evaluation. This is called the resolution level.

It is important to explicitly identify the resolution level since it has been found from experience that it is difficult to include more than three complexity levels in the same evaluation. For a thorough evaluation, the resolution level should include the complexity level above (the immediate context) and the complexity level directly below (the minimum level of detail for the chosen complexity level).

For example, if the institution works at a village level the resolution level should include the village level, the farm level below and the watershed, landscape or district level above. For an institution that is active at more than one level, the designers of the evaluation must determine which is the most relevant resolution level, or where its priorities or its eventual priority needs are to be found.

Define the sequence of analysis for different complexity levels

The sequence of analysis for the selected complexity levels must be established. It can be from higher complexity levels toward lower complexity levels, or vice versa, depending on the needs and preferences of the institution. The important thing is that everybody agrees on and understands the order of evaluation. Analysis is undertaken at each of the selected complexity levels in the agreed order.

From this point on the work should go through a series of cycles in which the different complexity levels chosen for analysis will be analysed and evaluated in the agreed sequence. Once this is accomplished, the overall analysis follows. The next section describes the analysis process for each complexity level.

Describe the chosen complexity level

The description of the chosen complexity level must include the ecological and human wellbeing dimensions of the complexity level. Usually a description of the ecological dimension includes, location, geography, hydrology, climate, soils and biological diversity. A description of the human wellbeing dimension usually includes population (ethnic groups, migration), productive aspects (production activities, production systems, technology, productive capacity and natural resources), economic aspects (micro, medium and macro economics depending on the level under consideration), cultural aspects (values, religion, artistic expression), infrastructure (communications,

services), institutional and social aspects (grassroots organisations, leadership, conflicts, standard of living). The specific aspects to be evaluated depend on the complexity level.

It is recommended that a formal document describing the complexity level is produced. The most important thing is to verify that different aspects are known and to gather and compile relevant information.

Prepare base maps

Base maps are prepared for each chosen complexity level. Base maps must include the geographical outline of the area, and the corresponding subdivisions of the level immediately below. For example, if the chosen levels are province, district and ward, the base map of the province must include both the outline of the province and the limits of its districts.

Base maps should show essential information, they do not need to be extremely detailed and polished maps. Base maps can be simple sketch maps or more sophisticated maps produced with the aid of simple computer programmes that enable the user to map information quickly and produce maps of high quality. An example of such a computer programme called Map Maker is described in the Overview booklet.

Hierarchical ordering of aspects to be evaluated

It is important that the evaluation be both integrated and systematic. It should be integrated to ensure that all relevant factors are considered and systematic so that the components follow in a coherent sequence. To make a systematic analysis of sustainability, its components have to be arranged in a hierarchical order. PRAM suggests a hierarchy of issues in five layers:

The Operation of PRAM

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1. System
    2. Sub System
        3. Dimensions
            4. Issues
                5. Indicators

System: The entire ecosystem and human population of the complexity level to be evaluated.

Sub-System: There are two sub-systems: human and ecological. The human sub-system includes all aspects of human activity such as production, economics, culture, ethics, religion, demography, and human rights. The ecological sub-system includes all biophysical aspects. The two sub-systems are fixed and independent of the complexity level at which one is working. It is impossible to make a meaningful analysis of sustainability without considering both sub-systems.

Dimensions: The dimensions suggested for consideration by PRAM are:

Ecological sub-system	Naturalness
	Degradation
	Biodiversity
Human sub-system	Economic production
	Values
	Attitudes
	Organisation
	Power

Issues: For each dimension there is a series of issues that need to be considered. Focusing on issues provides a way of dividing the dimensions

into specific and manageable groups. Issues are identified when the question 'what is going to be measured' is asked in the process. How to measure the issues is addressed through the identification of indicators.

Indicators: Indicators are specific measures that are used to evaluate each issue. Indicators must be defined for each complexity level, taking into consideration aspects such as the availability of information, the ease with which information can be collected, human and financial resources available, etc.

Identification and selection of issues and indicators

It is important that the identification and selection of issues and indicators is undertaken with the participation of the stakeholders involved. At the very least, members of the institution that is carrying out the assessment must participate in selection of indicators. Governmental and non- governmental institutions should also be involved in this process wherever possible.

The hierarchy described above is used to define issues and indicators for each complexity level. As a guide, not as a blueprint, example one includes the issues and indicators chosen for the work in Sierra Nevada de Santa Marta, Colombia, at a municipal level.

The indicator definition must minimally include the following elements:

- a description;
- whether the indicator is objective or subjective;
- the means of measurement (the formula for objective indicators, and the qualifying criteria for the subjective indicators); and
- the valuation or judgement scale from which measurements can be considered good or bad. The valuation scale range should try to be the same for all the indicators (1 to 3, 1 to 5, 0 to 100%, etc), and in all cases extreme values should mean the same (for example, the lowest value

always the best - the most sustainable situations). Both objective and subjective indicators may be chosen for consideration. Agreement has to be reached as to the interpretation of subjective indicators.

Measure indicators

Indicators are measured for each of the complexity levels that are to be evaluated.

Determining the value of an objective indicator is generally more simple since it depends on quantitative data. However, the quality of quantitative indicators needs to be assessed with respect to the relevance and accuracy of the data (for example, the age of the data, the methodology used to obtain it, the representativeness of data. Statistical analyses can be applied to most quantitative data.

Subjective or qualitative indicators are often just as reliable, and in many cases more reliable than quantitative data. Qualitative indicators allow evaluation of situations that defy quantitative measurement. It is important to identify and record the criteria used to obtain qualitative data, in order to get transparency and replicability. Qualitative data can be converted into a scale by identifying the range of possible positions and applying a ranking scale between the two extremes of the positions. Developing scales should be undertaken in a participatory process. People who know the issue to be assessed first hand should help to establish the criteria to be used. Often discussion and disagreements about scales and values is more valuable than the data itself.

Determining the reliability of information

The reliability of the data being used must be considered while deciding on indicators. This information is important when making decisions and later for monitoring purposes. Decisions based on less reliable information must be more carefully monitored than others. In addition, it is advisable to record the range of reliability of the information for future use.

Aggregate indicators, issues, dimensions, and system values

Indicator values must be aggregated to calculate the value of the relevant issue. Then the issues are aggregated to determine dimensions. Dimensions are aggregated to give sub-system values. A sustainability "index" is obtained by aggregating the two sub-systems.

The aggregation process can be done in at least two different ways: simple averages and weighted averages. Simple averages can be used when indicators are of equal importance. In this case, when selecting indicators, attention must be paid to find indicators of similar importance, that is, do not select very important indicators along with others much less important. The values are simply added together and an average value is calculated. Weighted averages are used when indicators are of different importance. A weight factor is given to each indicator based on their relative importance of the indicator in relation to other indicators. The weighted indicator values are then added together and an average calculated.

For example: if we have three indicators whose values were estimated as 2, 3 and 4, and whose weighting factors were 1, 3 and 3 then the addition is (2 x 1) + (3 x 3) + (4 x 3) = 23. The weight factor calculation is (1 + 3 + 3) = 7. The weighted average is 23/7 = 3.2. Note that this value differs from the simple average (which would have been 3).

Estimation of issues and dimensions is acceptable if one always makes clear the assumptions being made.

A final issue on aggregation is the adoption of one of the following criteria:

- the minimum criterion, according to which the aggregate value equals the most negative judgement. For example, if a variable has 3 indicators and its judgements are good, acceptable and bad, the variable judgement is

bad. The purpose of this system is to avoid the balance effect, through which good qualifications in any aspect balance (and therefore hide) bad situations.

- the average criteria, in which the aggregated judgement is the average of the existing judgements. In the previous example, the resulting judgement is acceptable. The basis is that the previous system has a bias towards negative aspects, therefore all situations tend to the extremes, and there is no adequate differentiation of intermediate situations that represents the majority of them.

Both approaches have advantages and disadvantges, that is why the solution is to agree on the use of one of them and to make it explicit, so all elements of bias can be clearly seen.

Map the indicators

All data obtained for the different indicators, issues, dimensions and sub-systems described must be mapped. The preparation of maps is central to the PRAM methodology. A map should not be seen as simply an end product for presentation purposes but as a working tool. A map acts as a tangible focus for discussion. The measured or estimated data for each indicator must be mapped for all areas, not just for a few pilot situations. The map can focus attention on areas where data is weak or problems exist. By consistently preparing maps in the same way, different situations, different sites, and different times can be more readily compared. The aim should be to reach a uniform level of information for the whole region, not just for those areas that are easy to reach or closer to the working sites or the homes of project staff.

Maps must be made as long as the evaluation exercise goes on, and they must be exhibited permanently so that everybody can go back over indicators already discussed, use the available information to support their positions or to challenge earlier hypotheses.

Once agreement has been reached on all the indicators and their values, an aggregation exercise must be done, up to the point where a representation of the whole system is possible. Indicators, issues, and dimensions are all reviewed and each one located on a map. When the whole exercise is finished, the resulting set of maps should be prepared and distributed so they can be used in daily work.

Why are maps important?

There is certainly nothing new about using maps in environmental projects. However, maps are frequently considered valuable objects to be kept hanging on walls or in cartography rooms. Unless maps are prepared and used by people working directly on environmental or natural resource issues, their potential as tools for understanding, decision making, and communication is lost.

Simply taking data from tables and documents and attaching them to a map places them in context. Many projects and environmental programmes are characterized by "pilot projects" where certain areas or sites are thoroughly covered, but they give little information about the overall situation. Attaching data to a map helps to reveal the global importance of the available information.

Even more important, maps are representations of geographical reality. Working with maps in different scales establishes a solid link between geographical reality and the evaluation process of PRAM. Linking PRAM with maps forces the users to relate their assessment work to concrete reality.

The whole region covered by the project or programme must be mapped from the very beginning, even if the information available is rough. A working scale should be chosen that is comparable to the complexity level. Decisions about research priorities and the kind of data that must be gathered will be affected by the need to keep increasing the map's reliability.

Identification of information gaps

In the process of measuring indicator values, information gaps (what is unknown, or not sufficiently understood), become apparent. This is valuable information for the institution or group that is making the evaluation. It must be carefully recorded and used as a decision making input to the evaluation process and to subsequently monitor the changes in information gaps. The gaps should change over time.

It is worthwhile keeping a list of information gaps in a visible place within the institution. This will enable the evaluation group to add new aspects to the list and think about how to solve them. The final list of information gaps and reliable information are an important part of the processes of reporting and developing institutional memory.

Make judgements

The process to this point has produced maps and a set of data that allows for comparisons between different parts of the same complexity level. The next step is to use the information collected to evaluate what is good, acceptable or bad in terms of sustainability. A numerical scale of good, acceptable or bad should be set for each indicator.

Judgements are based on the personal, institutional and cultural values of those doing the assessment, it is not possible to make recommendations about how to judge. Different people will judge the same set of data differently. As this problem has no solution, the only way to address it properly is through transparency. This means stating clearly what is going to be considered as good or bad (or desirable and undesirable), and explaining how these criteria are used to define the levels that separate good from bad for each indicator and issue.

Repeat the process at other levels

Once the first complexity level has been completed, the process must be repeated for the other chosen levels, following the procedure above described, and making the necessary changes to the variables and indicators to adjust them to the realities of the new levels that are being analysed.

Evaluate the situation as a whole

Having finished the analyses of different complexity levels, proceed to an evaluation of the whole, with a view to identifying priority actions. As stated in the conceptual framework, the purpose of evaluation is to strengthen reflection in order to make better decisions.

Three steps are suggested:

- a priority definition of the mission and objectives of the institution. This defines the "arena of action";
- preparation of a list of themes of possible action topics consistent with the mission and priority objectives. This list should include the dimensions, issues and directly related with the arena of action. Also analyse the reality that they portray (major-area problems, smaller-area problems, how these problems are broken down into smaller problems, how the descriptive information is linked to this, which elements from the level above affect this situation, etc.) to identify additional themes.
- determine priority themes and actions in relation to the institution's capacities and potential to implement the actions. This will reveal the contrast between actions that are needed and those that are actually taking place, and point to any necessary institutional changes.

Decision making

The intention of the evaluation process is that it should lead to better decision making for action. The institution or group that evaluates must review the corresponding mechanisms that will use the findings that emerge from the evaluation process. These findings include the identified priorities as well as the information gaps. Among the decisions that follow an evaluation will be actions to fill information gaps and to improve knowledge of the present situation.

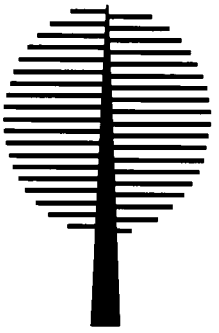
Document the work

Finally it is necessary to compile the information into a document. This includes data, maps and their criteria, analyses made, agreed decisions, and other outputs. This document should be sent to other institutions in the country, region, or in other countries, and to funding agencies as an example of the institution's capacity for analysis and reflection and as contribution to similar work of others.

This document will also be useful as a reference for similar future exercises. It will help to identify the trends of different processes, and to start to see the future from a clearer perspective. The analysis of successive reports will reveal the development of the institution's conceptual framework and the evolving dynamics of its reflective capacity.

Circulate and discuss the document within the institution

The document must be distributed among the members of the institution to enable them to examine and discuss it. The document is an explicit basis of consensus among the staff and it represents an important step in the criteria and priority unification to which they should revisit in order to reconsider discussions, agreements, give basis to positions or proposals, etc. In summary, the document should aim at becoming the tangible and evolving focus for the institution's memory.



Applicability of PRAM to Different Situations

PRAM has been found to be a useful methodology in several ways:

- as an initial diagnostic evaluation to design and set up projects and programmes aimed at sustainable rural development, natural resources and conservation management, and similar initiatives that include both environmental and social aspects;
- in the context of periodic evaluations within programme and project cycles;
- in a general evaluation of the existing situation at different complexity levels; and
- as a periodic general evaluation to detect ecological and social trends.

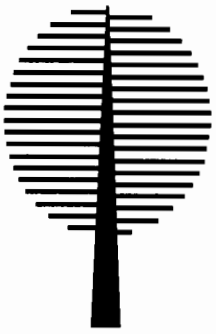
PRAM and Logical Framework Analysis (LFA)

Logical Framework Analysis is a project planning and evaluation technique widely adopted by funding agencies all over the world. One of its basic steps is the "problem tree" identification that is used later to develop project objectives and activities. In Colombia, GTZ (Germany) has encouraged the Pro Sierra Nevada Foundation to apply this Logical Framework technique to plan the Sierra Nevada Conservation Strategy.

The Logical Framework has proved to be an important tool, although weak points in some areas have arisen. For example, the Logical Framework requires explicit indicator identification to measure different objective and result achievements. It also demands that means of verification are identified and the assumptions stated. Frequently this task is not completely understood or it is done quickly and inadequately simply in order to respond to the requirements of funding agencies.

Application of PRAM to Different Situations (continued)

In the Sierra Nevada process (described in the Overview Document), PRAM has emerged as a useful and complementary process for the preparation of Logical Framework Analysis. PRAM may be used to develop an integrated understanding of the project framework, and as a hypothesis that describes people and ecosystem relationships, and the corresponding social and ecological processes. This hypothesis leads directly to a "hypothesis tree" that can be simultaneously considered with the LFA problem tree. In this way it helps to make a more careful preparation of the Logical Framework which should result in more effective and relevant projects.



Remaining Gaps and Final Remarks

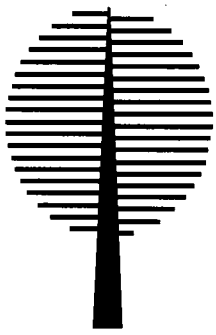
PRAM is not yet a fully developed method of evaluation. Various aspects need to be reviewed, developed, and tested in the near future. Among them are the following:

- Better ways to aggregate information. Because evaluation is carried out to improve decision making, it is necessary to make judgements and decisions on the basis of many disparate kinds of information. The way in which information is handled and aggregated in PRAM requires greater analysis, mostly regarding the assignment of weight factors to determine the relative importance of the indicator.
- Relationships between levels. PRAM proposes a balanced way to analyse the situation at a certain complexity level, but issues linked to complexity level inter-relationships have not been well examined. Some weaknesses have been noticed in relation to global factors such as international markets, global agreements and treaties, etc. with regard to the analysed levels.
- Landscape concept. PRAM proposes the use of landscape as an intermediate category that allows us to put together social and environmental characteristics for an area sharing similar characteristics. This concept still needs validation.
- Adaptation of PRAM to different decision levels. This document has been written for technical staff who work in rural development, sustainable development and natural resource management. However, the principles, concepts, and procedures are suitable, with some adaptation, for a range of other fields.

At the beginning we said that PRAM tries to focus on integrating all aspects of the situation (institutions, actors, context, monitoring, evaluation) with participation, analysis, reflection and mapping, supported by a simple system of dimensions, issues, and indicators developed for the situation. That is why

the output of the process using PRAM is not a simple classification like "sustainable" or "unsustainable". It is a series of action priorities emerging from an analytical, reflective and participatory process that is guided by simultaneous analysis of social and natural aspects that are represented by maps.

The output of an evaluation is not a final result, but rather a starting point for another cycle of reflection and action, which is the mechanism we propose to go forward, through negotiation, toward a more sustainable world.



Application Example 1

Sustainability analysis at regional level: Sierra Nevada de Santa Marta Conservation Strategy, Colombia

The Conservation Strategy for the Sierra Nevada (ECSN) is a process developed and implemented by the Pro-Sierra Nevada de Santa Marta Foundation. It grew from a diagnostic workshop that took place in the region in 1988, and a series of consultations with indigenous groups and farm communities, regional institutions and some private sector representatives. These meetings discussed ways to address the deepening environmental and social crisis in the Sierra Nevadas. People pointed out the need to prepare an action strategy with all the key stakeholders of the area as participants. In 1993 the Conservation Strategy process began with support from IUCN and GTZ (Germany).

The Conservation Strategy formulation was a participatory and reflective process focused on the situation in the Sierra Nevada. Its most important task has been that of gathering and sharing the views and proposals of the main actors - those who live in and/or make decisions about the Sierra Nevada. The objective was to identify options which could form the basis of an agreed plan of action for the region. A draft document is currently being discussed with a view to official ratification.

During 1995, an evaluation of the region's progress towards sustainability was carried out at the municipal level (note that in this region Provinces are divided into Municipalities which are in turn divided into Districts). The research was carried out by the ECSN team and other staff from the Foundation. This experience was used to develop and test the present methodology, and it is shown here as an example.

System:

Sierra Nevada de Santa Marta region: located on the Caribbean coast of Colombia. Just 40 kms inland the altitude reaches 5800 m, making it the highest coastal mountain range in the world. It covers an area of 21,159 square km, including three urban "departments" and eleven municipalities.

Application Example 1

Sub-Systems:
Ecological sub-system and human sub-system

Dimensions, Issues and Indicators:
They are shown in the following tables:

Ecological sub-system

Dimension	Issue	Indicators
Naturalness	Relationship between natural and modified ecosystems	Proportion of natural ecosystems (protected and used) in relation to the total area.
Biodiversity	Protection of representative samples of natural ecosystems	Proportion of ecosystems with some area under protection in relation to the total number of ecosystems
Degradation	Soil erosion	Subjective estimation of soil erosion level. Estimation made by local experienced people.

Social Sub-system

Dimension	Issue	Indicators
Productive base	Income level	Subjective estimation of relative income level and agricultural land availability. Made by local experienced people
	Agricultural land availability	
Values	Progress Notion	Subjective estimation of whether people associate progress with material wealth and status. Made by local experienced people.
	Alternative values	Subjective estimation of existence of alternative values to consumption as attachment to the land, family structure strength, attachment to traditions.
Attitudes	Knowledge/ awareness /action	Subjective estimation of the level of knowledge about environmental problems, of awareness about the need to change individual attitudes and the concrete actions that have been taken. Made by local experienced people.
	Respecting people's rights	Subjective estimation of the violence level (deaths, kidnappings, threats). Made by local experienced people.

Continued on page 36

Application Example 1

Continued from page 35

Dimension	Issue	Indicators
Organisation	Grassroots organisation	Number of current grassroots organisations (indigenous and farmer organisations, development committees, neighbourhood groups, etc.)
	Negotiation	Number of permanent instances where stakeholders with different interests participate (Land Management Committees, etc.)

A 1 to 5 scale was established for each indicator. For measurable indicators the maximum possible value was established at 5, and the minimum possible value at 0. The gap between them was divided into equal parts. For estimated indicators, in a specific meeting with experienced participants, it was determined which conditions will deserve maximum values (5) and minimum ones (0).

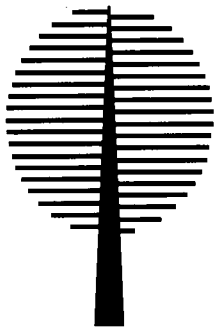
Once values were obtained, they were mapped individually. Then individual indicator values were aggregated to indicative issues, dimensions and systems by simple averaging. Weighing was not used. Aggregated values were also mapped as shown.

Results of Experience

The main output of the experience was an internal reflection process that encompassed several issues:

- an awareness of the institution's limited knowledge in certain areas, and the need to refocus efforts to address the situation.
- a recognition that the level of the institution's knowledge about the region is not consistent. Some areas are understood only superficially. Because of this, the need to strengthen institutional work in some areas was highlighted (and later implemented), particularly in the southern part of the mountain range, and
- a strong conceptual discussion about variables and selected indicators, and the way to determine their values. It was proposed that variables (related to farm and forest production as a very important linkage between ecological and social issues) be added as well as indicators such as alternative values even though they are imprecise.

In this way a reflective internal process led to a series of decisions to improve institutional work in the field.



Application Example 2

Sustainability analysis at farm level: experience of CATIE - Olafo in Peten, Guatemala

Since 1989 the project for Conservation for Sustainable Development in Central America (Olafo Project) has been active in Petén (Guatemala) testing the feasibility of sustainable and diversified natural forests management by local communities in the area. Implemented by CATIE (Tropical Agricultural Training and Research Centre) and supported by the Scandinavian aid organisations SIDA, DANIDA and NORAD, the activities of Olafo include natural forest management to extract wood and non timber resources (xate, bayal), as well as improved methods for cultivating traditional crops (such as maize), and the introduction of other sustainable alternatives like honey production and the use of native forage trees to feed domesticated goats. Two ecosystem-types of the four proposed by Prescott-Allen (1991) (natural, extractive, cultivated and built) were found (the extractive and cultivated ones). Natural (untouched by human beings) and built were not included due to their marginal importance in the analysed systems.

During 1995 an evaluation of the sustainability of improved and traditional systems (Reyes, 1996) was completed, based on guidelines proposed by Imbach (1995). The evaluation was based on the structure proposed by this document and issues and indicators suitable for the situation were identified. However, contrary to the PRAM proposal, three sub-systems were considered (ecological, economic and social). This kind of modification is acceptable so long as the process is not focused on quantitative results but on developing the reflective process aimed at improving the decision-making process.

The indicators and issues prepared for the farm system of the San Miguel, Petén case are shown below.

Sub-Systems:

Three sub-systems were used (ecological, economic, and social)

Dimensions, Issues, Variables, Indicators:

For example, extractive ecosystems, (wood extraction, and non timber resources)

Ecological sub-system

Dimension	Issue	Indicator (only for wood extraction)
Natural population condition	Population structure	Percentage of individual trees suitable for harvest, compared with the same percentage in a similar untouched area.
Extraction level	Harvest intensity	Comparison between the basal profitable area and the basal area of a future harvest. Comparison between the harvested volume and the allowed volume according to the Management Plan Comparison between real diameter growth and the diameter growth used in the Management Plan
	Harvest selectivity	Harvest selectivity index. Index based on relationships between different kinds of species percentages in the forest and harvested species.
Ecological impact of the extraction	Soil and vegetation damage	Percentage of uncovered soil after exploitation (the comparison was made with a maximum of 8% recommended by the ITTO) Damage percentages of the remaining vegetation (the comparison was made with the 15% maximum recommended by ITTO)

Application Example 2

2. Economic sub-system

Dimension	Issue	Indicator
Family income	Family income	Family benefits: total cash and non-cash income - cash expenses + Stock change family social benefits per work day
Enterprise behaviour	Money flow Enterprise results	Net flow: cash income - cash expenses Net income: (total income - established total costs and variables - Depreciations - Capital return)
Cultivation diversity	Cultivable vegetation	Comparison of the number of cultivable species and the number of cultivated species (with market and known prices)

Social sub-system

Dimension	Issue	Indicator
Security	Access to natural resources	Legal rights of access
	Jobs	Term of assured access Comparison between the employment generated by the production unit and the available family labour.
Organisation	Organisational situation	Level of self-management Membership of organised grassroots groups (cooperative, association, committees, etc.)
Limits on improvement	Formal education	Literacy Complete primary school education

As in the example presented in the previous Annex, the value of each indicator was estimated in a 1 to 5 scale. These values were aggregated using weighted averages. These averages were calculated by assigning a weighting factor ranging from 1 to 3 to each indicator, and multiplying the indicator value by the weighting factor. Results were added and divided by the result of adding all weighting factors.

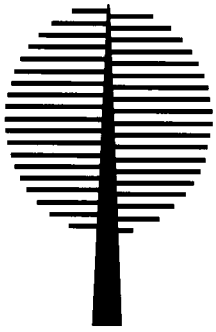
Application Example 2

Results of the Experience

The assessment process described here was used by the Olafo Project as a process to foster internal reflection within the Project team. This process led to the strengthening of conclusions and to the identification of new issues. Among them, the following ones can be highlighted:

a) The comparison between the traditional and improved farm production systems confirmed the better sustainability of the latter.
b) Two main factors that account for the success of the improved system were the long term access to the use of natural resources given to the communities through the community-forest concession mechanism, and the generation of new jobs at the local level by the forestry activities managed by the communities.
c) The concentration of timber extraction in a small number of species is affecting the long term sustainability of the forest activity. That has been accepted as a short-term trade-off, but it has started a process to generate a new project to address the issue of timber marketing and ways to broaden the range of species used for timber.

In addition the exercise also provided significant support for the development of a new initiative aimed at extending the improved systems to other communities in the Petén area.



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Founded in 1948 as the International Union for Conservation of Nature and Natural Resources, the IUCN brings together States, Government agencies and a diverse range of non-governmental organisations in a unique world partnership: over 800 members in all, spread across some 136 countries. As a Union, IUCN seeks to influence, encourage and assist societies throughout the world conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. The Union builds on the strengths of its members, networks and partners to enhance their capacity and to support global alliances to safeguard natural resources at local, regional and global levels.

The Strategies for Sustainability Programme of IUCN works to strengthen strategic planning, policy and implementation skills aimed at sustainable development at global, national and local levels. Working with networks of strategy practitioners from member governments, partner institutions and NGOs, the Programme assists in the conceptual development and analysis of experience in strategies, the development of a range of strategic planning and action planning skills, and improved methods of assessing human and ecosystem well-being.

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